Progress Energy

Serial: NPD-NRC-2009-064
April 6, 2009

10CFR52.79

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

LEVY NUCLEAR POWER PLANT, UNITS 1 AND 2
DOCKET NOS. 52-029 AND 52-030
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 020 RELATED TO IDENTIFICATION OF POTENTIAL HAZARDS IN SITE VICINITY

Reference: Letter from Brian C. Anderson (NRC) to Garry Miller (PEF), dated March 6, 2009, "Request for Additional Information Letter No. 020 Related to SRP Section 2.2.1-2.2.2 for the Levy County Nuclear Plant, Units 1 and 2 Combined License Application"

Ladies and Gentlemen:

Progress Energy Florida, Inc. (PEF) hereby submits our response to the Nuclear Regulatory Commission's (NRC) request for additional information provided in the referenced letter.

A response to the NRC request is addressed in the enclosure. The enclosure also identifies changes that will be made in a future revision of the Levy Nuclear Power Plant Units 1 and 2 application.

If you have any further questions, or need additional information, please contact Bob Kitchen at (919) 546-6992, or me at (919) 546-6107.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on April 6, 2009.

Sincerely,

Garry D. Miller
General Manager
Nuclear Plant Development

Enclosures/Attachments

cc : U.S. NRC Director, Office of New Reactors/NRLPO
U.S. NRC Office of Nuclear Reactor Regulation/NRLPO
U.S. NRC Region II, Regional Administrator
Mr. Brian C. Anderson, U.S. NRC Project Manager

Progress Energy Carolinas, Inc.
P.O. Box 1551
Raleigh, NC 27602

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Levy Nuclear Power Plant Units 1 and 2
Response to NRC Request for Additional Information Letter No. 020 Related to SRP Section 2.2.1-2.2.2 for the Combined License Application, dated March 6, 2009

NRC RAI #	Progress Energy RAI #	Progress Energy Response
02.02.01-02.02.02-1	L-0043	Response enclosed – see following pages
02.02.01-02.02.02-2	L-0044	Response enclosed – see following pages
02.02.01-02.02.02-3	L-0045	Response enclosed – see following pages
02.02.01-02.02.02-4	L-0046	Response enclosed – see following pages

Attachments	Associated NRC RAI #	Pages Included
FSAR Figure 2.2.1-204 (Rev 1 Draft)	02.02.01-02.02.02-2	3 pages
Attachment 1: Excerpts from the FEIS	02.02.01-02.02.02-4	5 pages
Attachment 2: ALOHA outputs	02.02.01-02.02.02-4	3 pages

NRC Letter No.: LEVY-RAI-LTR-020

NRC Letter Date: March 6, 2009

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.02.01-02.02-1

Text of NRC RAI:

RG 1.206 provides guidance regarding the information needed to ensure potential hazards in the site vicinity are identified and evaluated to meet the siting criteria in 10 CFR 100.20 and 10 CFR 100.21. FSAR Section 2.2.2.2.1.1 states that the chemicals associated with LNP Units 1 and 2 are bounded by those listed in AP1000 DCD, Table 6.4-1. Westinghouse has issued or is issuing a detailed revised standard chemicals list for the AP1000 design which deviates from the original AP1000 DCD Table 6.4-1. The applicant should address these chemicals and any additional site specific chemicals used along with quantities and locations stored onsite for LNP Units 1 and 2.

PGN RAI ID #: L-0043

PGN Response to NRC RAI:

Westinghouse has issued a revision to the chemicals listed in AP1000 DCD Table 6.4-1 via WEC letter DCP/NRC 2345 dated January 19, 2009. An assessment of the impact of the changes in the Westinghouse design details and any additional Levy site specific chemicals has been provided to the staff in Progress Energy Letter Serial No.: NPD-NRC-2009-034 dated March 2, 2009 in response to NRC Letter from Ravindra G. Joshi (NRC) to Garry Miller (PEC), dated February 3, 2009, "Request for Additional Information Letter No. 008 Related to SRP Section 06.04 for the Levy County Nuclear Plant, Unit 1 and 2 Combined License Application".

Associated LNP COL Application Revisions:

The changes to the Levy FSAR are provided in Progress Energy Letter Serial: NPD-NRC-2009-034 dated March 2, 2009.

Attachments/Enclosures:

None.

NRC Letter No.: LEVY-RAI-LTR-020

NRC Letter Date: March 6, 2008

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 02.02.01-02.02.02-2

Text of NRC RAI:

RG 1.206 provides guidance regarding the information that is needed to ensure potential hazards in the site vicinity are identified and evaluated to meet the siting criteria in 10 CFR 100.20 and 10 CFR 100.21. The NRC Staff's review of FSAR Sections 2.2.2.7 and 3.5.1.6 indicates that there two 8 mile wide Federal Victor Airways, VR 1006 and V7-521, whose center line are within 4 miles of the LNP site. Therefore, in accordance with the acceptance criteria for FSAR Section 3.5.1.6, the aircraft hazards associated with these Victor Airways should be evaluated and addressed in Section 3.5.1.6. Please provide an evaluation of each, or provide a justification for their exclusion.

PGN RAI ID #: L-0044

PGN Response to NRC RAI:

There are five airways that have the outer boundary within 2 miles of the LNP site:

Airway	Distance to LNP Site from the Airway Centerline
V7-521	4.5 miles
VR 1006	3.1 miles
J119	0 miles
Q110-116-118	0 miles
Q112	0.7 miles

The boundary of each airway is 4 nautical miles from the centerline, thus, each of these airways is within 2 miles of the LNP site. Therefore, in accordance with the acceptance criteria for FSAR Subsection 3.5.1.6, the aircraft hazards associated with these airways will be evaluated. After the evaluation is completed, the associated FSAR changes will be provided to NRC by July 31, 2009. These changes will be added to the FSAR in a future revision.

Associated LNP COL Application Revisions:

The following changes will be made to the LNP FSAR in a future revision:

1. Add the following sentence as the last paragraph of FSAR Section 2.2.2.7:

   "The outer boundaries of five airways are routed within 2 miles of the LNP site: V7-521, VR 1006, J119, Q110-116-118 and Q112 (shown on Figure 2.2.1-204)."

2. Replace FSAR Figure 2.2.1-204, in its entirety, with the version attached (see **Attachments/Enclosures** below). A second and third sheet have been added to Figure 2.2.1-204 that indicates the routes of Airways V7-521, J119, Q110-116-118 and Q112.

Attachments/ Enclosures:

Revised FSAR Figure 2.2.1-204 (Rev 1 Draft) – Airports and Airways (Sheets 1, 2, and 3)

NRC RAI No.: LEVY-RAI-LTR- 020

NRC Letter Date: March 6, 2009

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 02.02.01-02.02.02-3

Text of NRC RAI:

FSAR Section 2.2.3.6 states that no safety-related equipment is located at the intake structure. Therefore, spills drawn into the intake structure do not pose a nuclear safety hazard. RG 1.206, Section C.1.2.2.3.1(6) states that applicant should consider the accidental release of oil or liquids that may be corrosive, cryogenic, or coagulant to determine if a potential exists for such liquids to be drawn into the plant's intake structure and circulating water system or otherwise affect the plant's safe operation. Please describe how the accidental release of these oils or liquids was considered.

PGN RAI ID #: L-0045

PGN Response to NRC RAI:

As noted in FSAR Subsection 2.4.1.1, the Cooling Water Intake Structure (CWIS) is located on the berm that forms the north side of the Cross Florida Barge Canal (CFBC), approximately 6.9 mi. from the Gulf of Mexico, and supplies approximately 84,780 gpm of cooling water to Levy Nuclear Plant (LNP) 1 and LNP 2. The CFBC was designed to have a depth of 12 ft. and a minimum bottom width of 150 ft., as stated in FSAR Subsection 2.4.1.2.5. The Gulf of Mexico, through the CFBC, essentially provides an unlimited source of make-up water for the Levy Nuclear Plant.

Subsection 2.2.2.4 of the FSAR states the Inglis Lock was decommissioned in 1999 and the CFBC is now used for recreational boating. In addition, the Inglis Mine utilizes a section of the CFBC to the west of U.S. Highway 19 for periodic shipments of limestone. Neither category of water traffic is considered likely to possess or transport liquids that may be corrosive, cryogenic, or coagulant. Accidental release of minor quantities of oil could be associated with marine engine operation but would be effectively diluted by the water in the CFBC and Gulf of Mexico. In addition, the operation of the CWIS does not require the use of such materials.

As noted in FSAR 2.4.1.1, LNP 1 and LNP 2 will each use a passive core cooling system to provide emergency core cooling without the use of active equipment in the event of a CFBC failure. A failure of the CFBC or the CWIS would lead to a loss of make-up water to the LNP units and, ultimately, a loss of the Circulating Water System (CWS).

Therefore, in the unlikely event an accidental spill of oil or liquids that may be corrosive, cryogenic, or coagulant in nature, the CFBC would provide ample dilution before any such liquids reached the CWS. Even if the operation of the CWS were adversely affected by such an accidental spill, there would be no impact on the ability of the plant to safely shutdown.

Associated LNP COL Application Revisions:

None.

Attachments/Enclosures:

None.

NRC Letter No.: LEVY-RAI-LTR-020

NRC Letter Date: March 6, 2009

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.02.01-02.02.02-4

Text of NRC RAI:

In FSAR Section 2.2.3.2.3, the applicant stated that unconfined vapor explosions of natural gas are not considered credible events. Therefore, deflagration of a natural gas/air mixture is taken as the limiting case. In terms of plant safety, this is considered as assuring that a mixture within the flammable limits is not present near the safety-related structures. FSAR Section 2.2.3.2.3 rules out delayed flammable cloud ignition on the basis of insufficient gas concentrations at the LNP. However, this does not preclude ignition at a location between the pipeline and the LNP. Hence, the overpressure hazard from either immediate or delayed ignition of the vapor cloud needs to be estimated. In addition, provide a basis for the statement that unconfined vapor explosions of a natural gas/air mixture are not credible.

PGN RAI ID #: L-0046

PGN Response to NRC RAI:

The fact that an unconfined vapor explosion of a natural gas/air mixture is not considered a credible event is documented in numerous sources including Final Environmental Impact Statements (FEIS) for natural gas line projects and NRC Safety Evaluation Reports (SER). Annotated excerpts from the FEIS for the Midcontinent Express Pipeline Project and NUREG-0014, SER for the Hartsville Nuclear Plants are provided as Attachment 1 to this response. Nevertheless, an estimate of the potential overpressure from delayed ignition of the vapor cloud was made using the ALOHA Version 5.4 computer code (ALOHA, "Areal Locations of Hazardous Atmospheres", U.S. ENVIRONMENTAL PROTECTION AGENCY and NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, February, 2006). Two cases were examined. The first evaluated the threat zone to achieve a 1 psi overpressure assuming a rupture of the 30 inch natural gas pipeline. The results indicate an overpressure of 1 psi is not exceeded at any distance. The second was a very conservative case assuming the entire inventory of the pipeline in the vicinity of LNP was ignited as a point source at the minimum separation distance of 3703 feet from the leading edge of the flammable cloud to the site critical structures. The results indicate the overpressure would be approximately 0.342 psi. The ALOHA outputs are provided as Attachment 2 to this response.

Associated LNP COL Application Revisions:

The following change will be made to the LNP FSAR in a future revision:

1. Add the following after the second sentence of the last paragraph of LNP FSAR Section 2.2.3.2.3:

The downwind concentration was estimated as a function of stability classes C, D, F and G and wind speeds varying from 1 to 15 meters per second. The results demonstrate that the maximum distance of the frontal boundary of the flammable concentration (4.8 %) from the pipeline is 2100 feet for stability category C and a wind speed of 15 m/sec. The majority of the flammable portion of the gas cloud will be even closer to the pipeline and therefore farther from the Levy site. This results in a minimum separation distance from the leading edge of a potentially flammable cloud to the site critical structures of 3703 feet.

The heat intensity for a sustained jet fire at the break location was determined to be no more than 300 Btu/hr/ft^2 (equivalent to solar heat flux on the ground) at a distance of 2907 feet from the 30 inch gas line. As noted above, the minimum separation distance from the leading edge of a potentially flammable cloud to the site critical structures is 3703 feet.

The potential overpressure from deflagration of the vapor cloud at the closest point of approach (3703 feet from the site critical structures) is considered negligible (< 1 psi).

Attachments/Enclosures:

Attachment 1: Annotated excerpts from the FEIS for the Midcontinent Express Pipeline Project and NUREG-0014, SER for the Hartsville Nuclear Plants.

Attachment 2: ALOHA outputs.

List of Attachments:

1) NRC RAI # 02.02.01-02.02.02-2 [PGN RAI ID #L-0044]:

   Revised FSAR Figure 2.2.1-204 (Rev 1 Draft) – Airports and Airways (Sheets 1, 2, and 3) [3 pages]

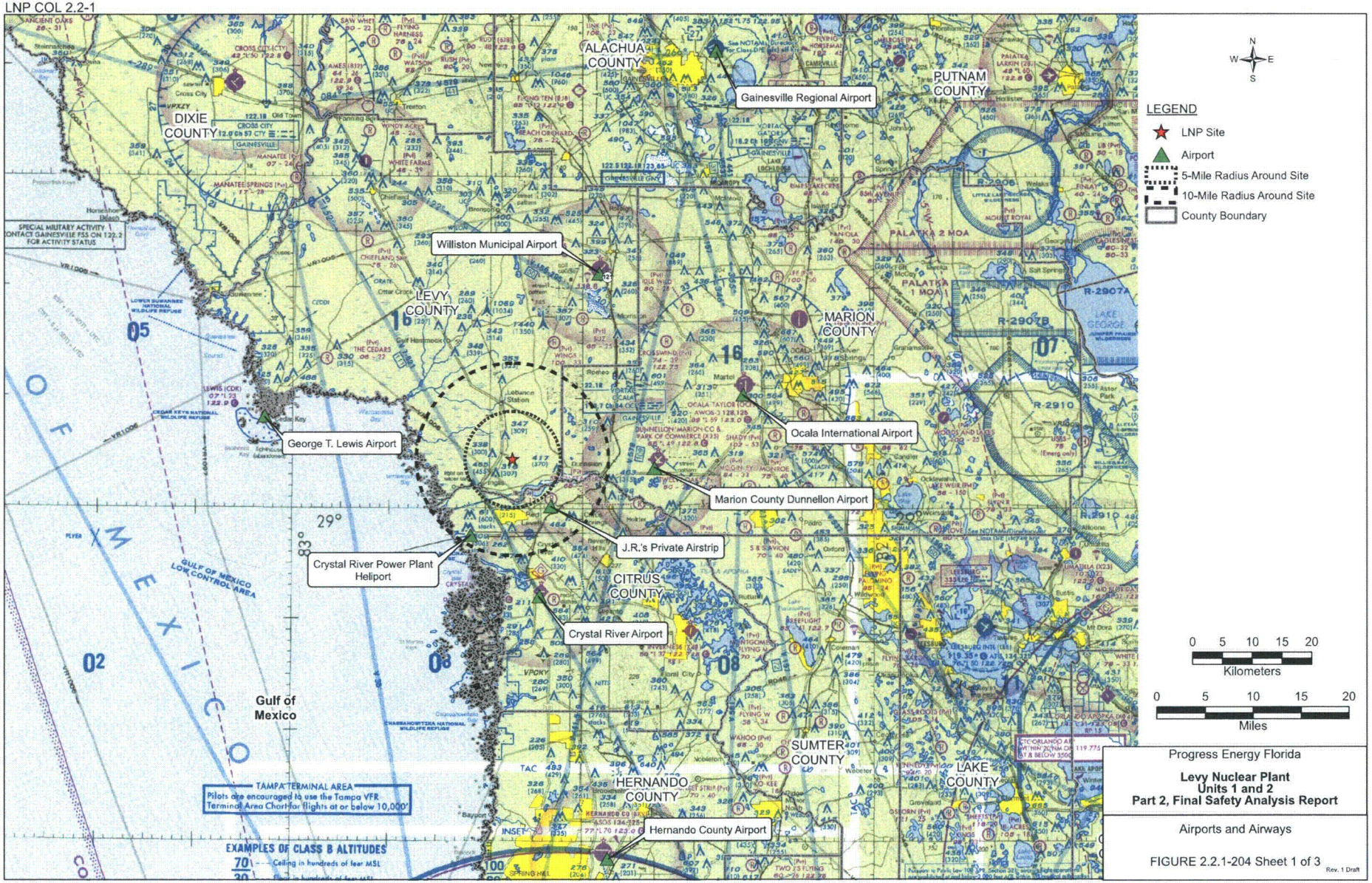
2) NRC RAI # 02.02.01-02.02.02-4 [PGN RAI ID #L-0046]:

   Attachment 1: Annotated excerpts from the FEIS for the Midcontinent Express Pipeline Project and NUREG-0014, SER for the Hartsville Nuclear Plants [5 pages]

3) NRC RAI # 02.02.01-02.02.02-4 [PGN RAI ID #L-0046]:

   Attachment 2: ALOHA outputs [3 pages]

LNP COL 2.2-1



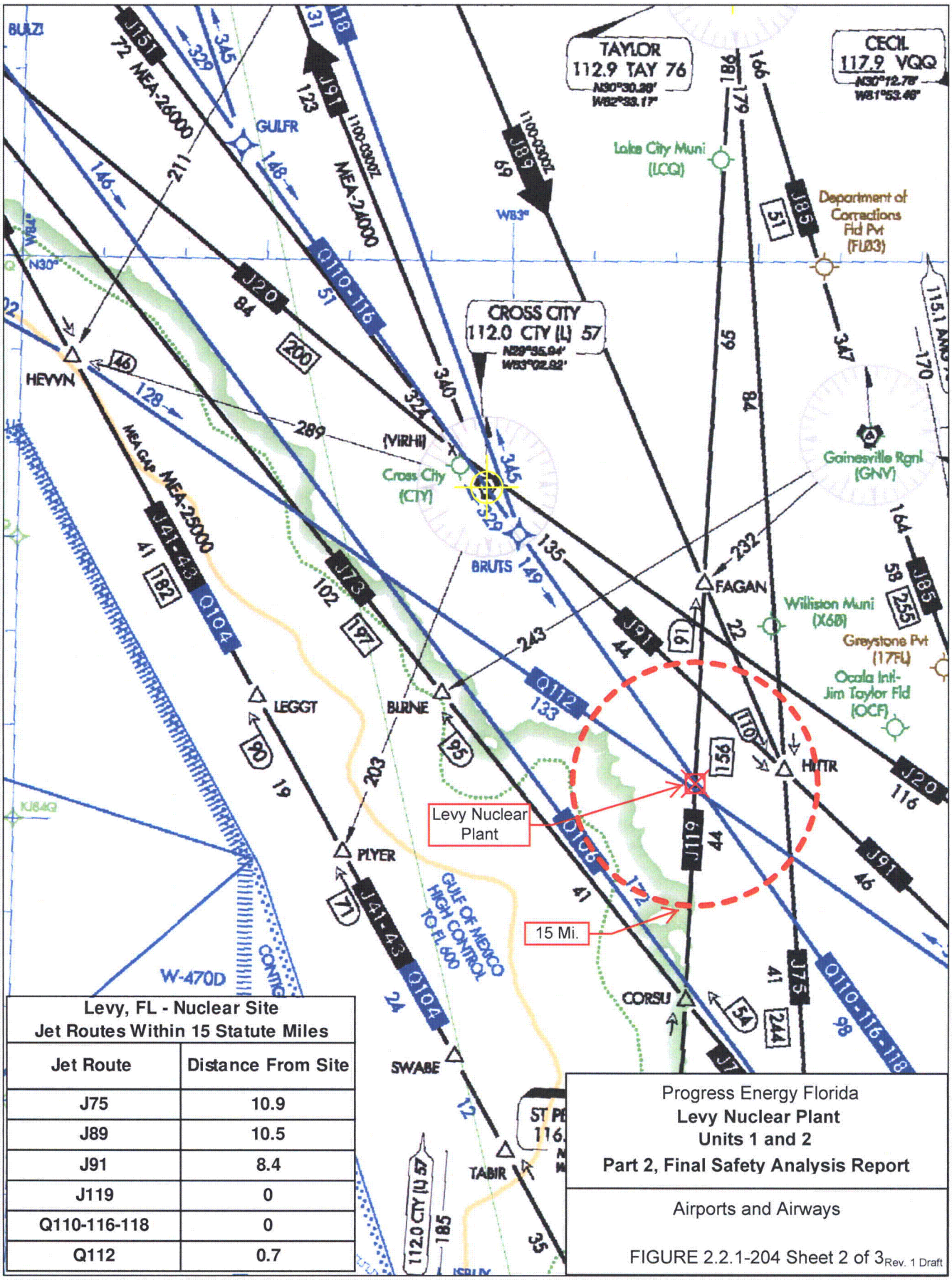
Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Part 2, Final Safety Analysis Report

Airports and Airways

FIGURE 2.2.1-204 Sheet 1 of 3

Rev. 1 Draft

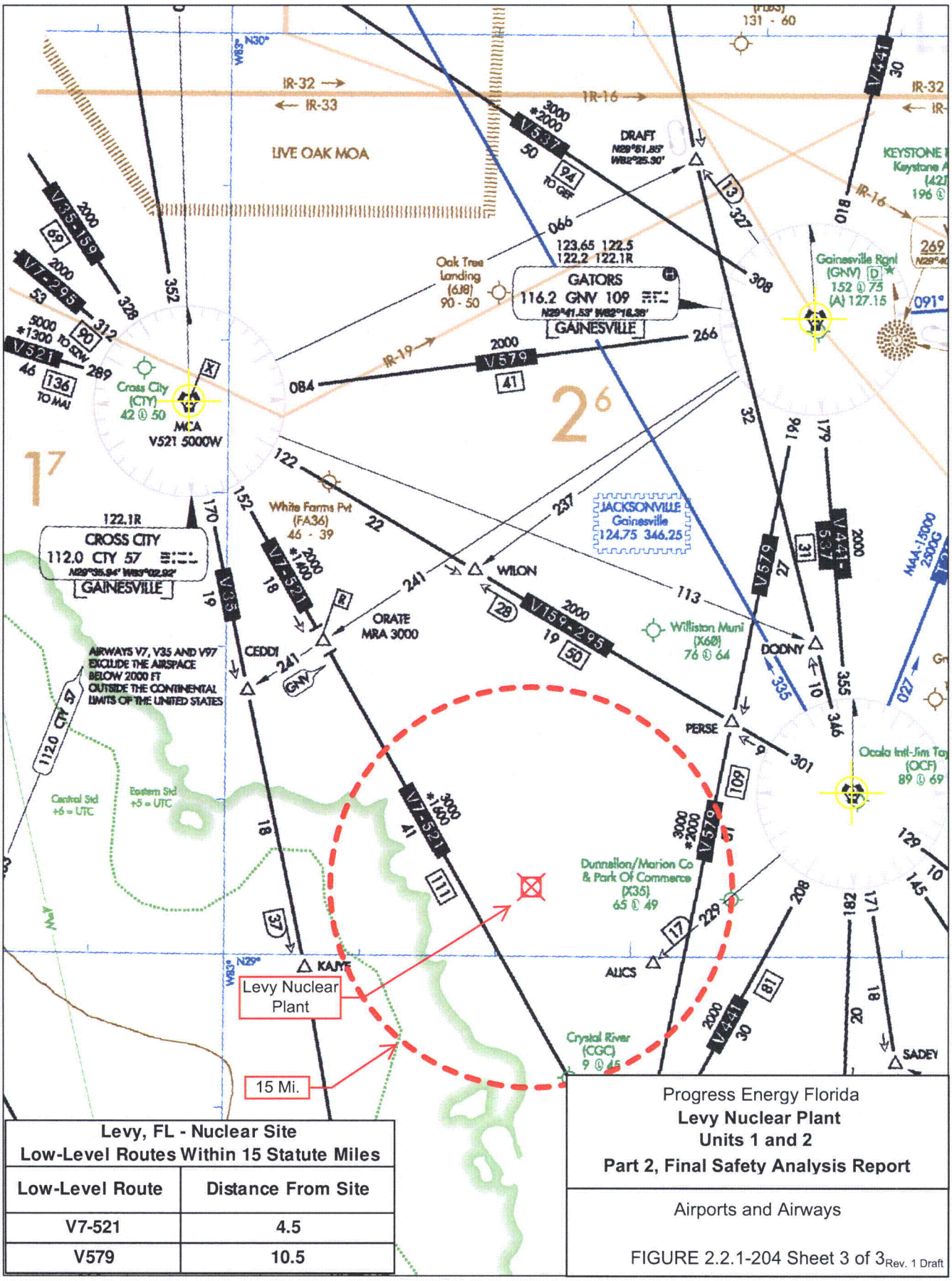


Levy, FL - Nuclear Site Jet Routes Within 15 Statute Miles	
Jet Route	Distance From Site
J75	10.9
J89	10.5
J91	8.4
J119	0
Q110-116-118	0
Q112	0.7

Progress Energy Florida
Levy Nuclear Plant
Units 1 and 2
Part 2, Final Safety Analysis Report

Airports and Airways

FIGURE 2.2.1-204 Sheet 2 of 3 Rev. 1 Draft



Levy, FL - Nuclear Site Low-Level Routes Within 15 Statute Miles	
Low-Level Route	**Distance From Site**
V7-521	4.5
V579	10.5

Progress Energy Florida
Levy Nuclear Plant
Units 1 and 2
Part 2, Final Safety Analysis Report

Airports and Airways

FIGURE 2.2.1-204 Sheet 3 of 3 Rev. 1 Draft

ATTACHMENT 1

Annotated excerpts from the FEIS for the Midcontinent Express Pipeline Project and NUREG-0014, SER for the Hartsville Nuclear Plants

ATTACHMENT 1

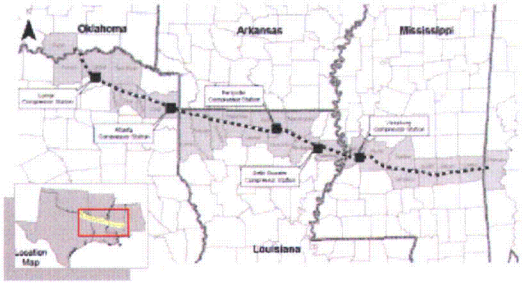
Final Environmental Impact Statement

Volume 1

Midcontinent Express Pipeline Project

Midcontinent Express Pipeline, LLC

Docket Nos. CP06-6-000
PF07-4-000
FERC EIS 0220F



Federal Energy Regulatory Commission
Office of Energy Projects
Washington, DC 20426

May 2008

U.S. Army Corps of Engineers | U.S. Fish & Wildlife | National Park Service | Natural Resources Conservation Service | U.S. Environmental Protection Agency

Louisiana Department of Quality Environmental | Texas Parks & Wildlife Department Service | Alabama Department of Conservation & Natural Resources | Louisiana Department of Wildlife and Fisheries | Mississippi Department of Wildlife, Fisheries and Parks

As described in Sections 2.4 and 3.11.1, construction of the proposed compressor stations would be completed in phases, as proposed. Our analysis of operational noise effects assumed operation of the total planned compression capacity at all proposed stations and predicted that no significant noise-related effects would occur to the NSAs nearest the compressor stations. However, given the phased construction schedule proposed by MEP, it is possible that NSAs would be constructed nearer to the proposed Atlanta and Vicksburg Compressor Stations prior to their construction. If NSAs were constructed closer to the compressor station sites, the predicted noise-related effects evaluated in this EIS would be invalidated. In addition, we believe that the actual noise levels resulting from operation of the proposed compressor stations should be measured to ensure that they do not exceed the levels analyzed in this EIS. Therefore, we recommend that:

- **MEP should conduct noise surveys to verify that the noise attributable to operation of each of the compressor stations does not exceed an L_{dn} of 55 dBA at any NSA following the installation of all authorized compressor units at each station and file the results of those surveys with the Secretary no later than 60 days after placing all authorized compressor units in service or prior to the start of the next phase of construction, whichever is sooner. If the noise attributable to operation of any of the compressor stations exceeds 55 dBA L_{dn} at any NSA, MEP should file a report on what additional noise controls are needed to meet that level and install any required controls within one year of the in-service date of the associated compressor unit(s) or prior to the start of the next phase of construction, whichever is sooner. MEP should confirm compliance with the L_{dn} of 55 dBA requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls or prior to the start of the next phase of construction, whichever is sooner.**

MEP will construct 12 pipeline interconnect sites which will be equipped with pressure reducing valves. Eight of the interconnect sites will also be equipped with pipeline heaters. Pressure reducing valves and the combustion air blowers on heaters are noise sources. Unmitigated noise generated from the interconnect sites will range from 35 to 55 dBA L_{dn} at the nearest NSAs.

If MEP provides assurance that any noise impacts have been mitigated, as required by the above recommendations, we believe that Project-related operations would not result in a significant effect on the noise environment.

3.12 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some risk to the public in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death.

Methane has an ignition temperature of 1,000 °F and is flammable at concentrations between 5.0 percent and 15.0 percent in air. Unconfined mixtures of methane in air are not explosive. However, a flammable concentration within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses rapidly in air.

ATTACHMENT 1

Safety Evaluation Report

related to construction of

Hartsville Nuclear Plants Units A 1, A 2, B 1 and B 2

Tennessee Valley Authority

PB 251 599
NUREG-0014

U. S. Nuclear Regulatory Commission

Office of Nuclear Reactor Regulation

Docket Nos. STN 50-518
STN 50-519
STN 50-520
STN 50-521

April 1976

ATTACHMENT 1

An extensive evaluation of the safety implications of the pipeline has been performed. The possible ingestion of flammable gas concentrations into the plant air intakes, the occurrence of high thermal radiation fluxes, and the probability of the plant being adversely affected by external overpressure and missile generation from ignition of a gas cloud were considered in the evaluation. Among the parameters included in an analysis of the consequences of postulated pipeline accidents were the break size and location, the gas release rate assuming failure of all shutoff valves, the plume rise of the gas cloud and dispersion under various meteorological conditions, the time from rupture to ignition, and the deflagration and detonation of the gas cloud.

We have reviewed the applicant's submitted analyses of the probability and consequences of an accident occurring to the East Tennessee Natural Gas Company pipeline. In addition, we performed an independent analysis of the consequences of such an accident, which included consideration of a variety of postulated mechanisms of expansion and dispersal of natural gas from the pipeline. As a result of this review and analysis, we concur with the applicant's conclusion that there is no identifiable pipeline accident that could credibly lead to flammable gas concentrations at the plant air intakes. We have also concluded that the state of knowledge concerning the chemical reactions of natural gas mixed with air is sufficiently well established to form a basis for the judgment that the detonation of an unconfined natural gas dispersal in air is not a credible event. We have concluded that even if a natural gas cloud from a pipeline failure were to detonate, the maximum transient pressures expected at the safety-related structures would not produce overpressures in excess of the plant design overpressure criteria.

We have not identified any circumstances or incentives which would lead to the use of the pipeline to transport materials more hazardous than natural gas in the future. However, the applicant has committed to move the pipeline in the event that sometime over the lifetime of the plant, the East Tennessee Natural Gas Company would plan to transport propane or any other products through the pipeline instead of natural gas if these were determined to present the potential for unacceptable damage to the plant.

We concur with the applicant's conclusion that the existence of the East Tennessee Natural Gas Company pipeline represents no undue threat to the safe operation of the proposed Hartsville facility, and that accidents occurring to that pipeline need not be considered in the design of the plant.

The applicant has identified the industrial, military, and transportation activities in the vicinity of the site and has evaluated the potentially hazardous activities. We conclude that none of these activities will adversely affect the safe operation of the plant.

ATTACHMENT 2

ALOHA Outputs

ATTACHMENT 2

Text Summary ALOHA® 5.4

```
SITE DATA:
  Location: TAMPA, FLORIDA
  Building Air Exchanges Per Hour: 60 (user specified)
  Time: March 29, 2009  1205 hours EST (user specified)

CHEMICAL DATA:
  Chemical Name: METHANE                  Molecular Weight: 16.04 g/mol
  TEEL-1: 15000 ppm   TEEL-2: 25000 ppm   TEEL-3: 50000 ppm
  LEL: 44000 ppm      UEL: 165000 ppm
  Ambient Boiling Point: -258.7° F
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 15 meters/second from w at 3 meters
  Ground Roughness: urban or forest       Cloud Cover: 5 tenths
  Air Temperature: 80° F
  Stability Class: C (user override)
  No Inversion Height                     Relative Humidity: 50%

SOURCE STRENGTH:
  Flammable gas escaping from pipe (not burning)
  Pipe Diameter: 30 inches                Pipe Length: 10000 meters
  Unbroken end of the pipe is connected to an infinite source
  Pipe Roughness: smooth                  Hole Area: 707 sq in
  Pipe Press: 1200 psia                   Pipe Temperature: 80° F
  Release Duration: ALOHA limited the duration to 1 hour
  Max Average Sustained Release Rate: 189,000 pounds/min
     (averaged over a minute or more)
  Total Amount Released: 5,873,282 pounds

THREAT ZONE:
  Threat Modeled: Overpressure (blast force) from vapor cloud explosion
  Type of Ignition: ignited by spark or flame
  Level of Congestion: uncongested
  Model Run: Gaussian
  Yellow: LOC was never exceeded --- (1.0 psi = shatters glass)
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ATTACHMENT 2

Text Summary ALOHA® 5.4

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SITE DATA:
  Location: TAMPA, FLORIDA
  Building Air Exchanges Per Hour: 60 (user specified)
  Time: March 29, 2009  1205 hours EST (user specified)

CHEMICAL DATA:
  Chemical Name: METHANE                  Molecular Weight: 16.04 g/mol
  TEEL-1: 15000 ppm    TEEL-2: 25000 ppm    TEEL-3: 50000 ppm
  LEL: 44000 ppm      UEL: 165000 ppm
  Ambient Boiling Point: -258.7° F
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 15 meters/second from w at 3 meters
  Ground Roughness: urban or forest       Cloud Cover: 5 tenths
  Air Temperature: 80° F
  Stability Class: C (user override)
  No Inversion Height                     Relative Humidity: 50%

SOURCE STRENGTH:
  Direct Source: 1800000 pounds           Source Height: 0
  Release Duration: 1 minute
  Release Rate: 30,000 pounds/sec
  Total Amount Released: 1,799,998 pounds
  Note: This chemical may flash boil and/or result in two phase flow.
     Use both dispersion modules to investigate its potential behavior.

THREAT AT POINT:
  Overpressure Estimate at the point:
  Downwind: 3703 feet                     Off Centerline: 0 feet
  Overpressure: 0.342 psi
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